REMARKS

The Examiner rejected claims 1-7, 11, 13-16 under 35 U.S.C. 112, first paragraph as failing to comply with the description requirement thereof since the claims introduce new matter not supported by the original disclosure. Applicant submits that as currently amended, claims 1-7, 11, 13-16 do comply with the description requirement of 35 U.S.C. 112, first paragraph.

The Examiner stated that the Examiner was unable to locate support in the original disclosure to support the amendments made to claim 1 and claim 5 in Applicant's communication dated August 11, 2009.

Claim 1 has now been amended to make it clear that (1) the combination of the test system and the DUT comprises a plurality of components, each component being characterized by a value that varies in accordance with an expected corresponding probability distribution, and (2) each model element of the test system model provided represents a corresponding one of those components.

The original disclosure provides support for this amendment in passages including the following, taken from paragraph 0018,

> *"In an embodiment of the present invention, a model of the test system running on a circuit simulator establishes measurement uncertainty by varying the parameters of the components in the test system within their ranges of uncertainty. In some embodiments, the parameters are randomly varied within a probability distribution*" and, taken from paragraph 0019, "*A simplified test system model 52 includes a numerical representation (model) of the source 14, DUT 12, and other components of a test system. The source 14 is connected to the DUT 12 with a transmission line 54 and the DUT 12 is connected to the receiver 24 with a transmission line 56. Alternatively, a test system model includes individual switches and cable segments, with their associated uncertainties, instead of simple transmission lines 54, 56;* and,

taken from paragraph 0022, *"The screen shot shows the parameters entered into the test system model 52 for the various components, and the simulator settings 58. For example, the signal source 14 is modeled as providing a 1 GHz single tone of 1V (V=1) with a statistical Gaussian variation of +1%".*

Claim 5 has been amended to make it clear that the noise term represents variations in noise generated by a corresponding component in said combination of said test system and said DUT, said variations in noise being characterized by a corresponding one of said probability distributions. Paragraph 0026 of the original disclosure supports this amendment in the following passage: *"The measurement receiver 24 includes a noise source 60 and a fifty-ohm termination ($R_{L.}$) 62. The noise component is modeled as a signal source providing a second 1 GHz signal that varies +0.01 V around 0.0 volts in a Gaussian fashion".*

Accordingly, Applicant submits that as currently amended, claim 1, claim 5 and the claims dependent therefrom do comply with the description requirement of 35 U.S.C. 112, first paragraph.

The Examiner objected to claims 1, 5-6, and 16 because of a number of informalities, as detailed below.

The Examiner objected to claim 1 because "the plurality of model element values" recited in lines 11-12 did not have antecedent basis. The term in question has been amended to recite "the plurality of values". Line 2 of the claim has been amended to make it clear that each component of a plurality of components is characterized by one of a corresponding plurality of values. Hence, the term "the plurality of values" now has adequate antecedent basis.

The Examiner objected to claim 5 because "the plurality of probability distributions" recited in lines 1-2 did not have antecedent basis in claim 1, from which claim 5 depends. Lines 2-3 of claim 1 have been amended to make it clear that each value of a plurality of values varies in accordance with one of a corresponding plurality of expected probability distributions. Hence, the term "the plurality of probability distributions" in claim 5 now has adequate antecedent basis..

The Examiner objected to claim 6 because "the plurality of uncertainty terms" did not have antecedent basis. The term has been amended to recite “the plurality of probability distributions”, correcting the defect.

The Examiner objected to claim 16 because "the step of developing the test system did not have antecedent basis. The term has been amended to recite “providing” rather than “developing”, correcting the defect.

The Examiner rejected claims 1-4, 6-7, 11, and 13-16 under 35 U.S.C. 103(a) as being unpatentable over Jamneala et al. (U.S. Patent No. 6,804,807), in view of Piratelli-Filho et al. (Uncertainty Evaluation in small angle Calibration using ISO GUM Approach and Monte Carlo Method, June 2003). Applicant submits that as currently amended, claims 1-4, 6-7, 11, and 13-16 are not obvious in view of the cited prior art.

The Examiner states that Jamnneala teaches all the limitations of claim 1 except for explicitly using the term “measurement uncertainty” and disclosing associated probability distributions. The Examiner looks to Piratelli-Filho for the missing teachings. The Examiner maintains that it would have been obvious to combine the uncertainty evaluation method of Piratelli-Filho with the method of Jamneala “because Piratelli-Filho et al. teaches obtaining expanded uncertainty results which proved simplified analysis (see abstract)”.

Claim 1 has been amended to make it clear that the simulation runs **vary values of model elements** representing components in the test system in accordance with **expected probability distributions** corresponding to those model elements, and hence, corresponding to those components, in order to provide the measurement of the uncertainty in the DUT test parameter resulting from variations of those test system component values.

Jamneala teaches a method for optimizing the determination of inductance parameters in a model for a GSC probe by running simulations of the probe on a simulator and varying the model parameters from their initial values, based on rough measurements, until the model provides simulated results for the use of the probe on some electronic device of interest that are satisfactorily close to the measured results of using the actual probe on that device of interest. In other words, the inductance values in the model are optimized to match the model as closely as possible to an actual GSG probe, even though the available measurements of probe inductances characterizing the probe may be far from accurate. The Examiner interprets the inductance parameters of the GSC probe model as the values that are varied during the simulation iterations of Jamneala. There is no teaching in Jamneala that the variation of the inductance values is carried out in accordance with any expected probability distributions. The Examiner looks to Piratelli-Filho for teachings that concern expected probability distribution.

Piratelli-Filho teaches a method for measuring the overall error in a particular measurement that results from **variations in the measurements** of "all the variables influencing the measurand" (section 2.1-1). Each measurement has a corresponding expected probability distribution. A Monte Carlo simulation is run to determine the effect of these separate **errors in the measurements** on the overall system measurement error. In this regard, it should be noted in Piratelli-Filho, a series of measurements will yield a series of values that differ randomly from one measurement to the next, because of noise or other short-term variations in the influencing variables. The corresponding measurement uncertainty indicates the precision with which an overall measurement can be made. In Jamneala, however, the variation of inductance values is not an indication of random variation in any measurement, but a deliberate variation targeted to converge on values that optimize a model.

For the teachings of Piratelli-Filho to be applied to the system of Jamneala, first, Jamneala would need to be provided with measurements of the inductance values of the GSC probe, along with the expected probability distributions for those inductance values. There is no teaching in Jamneala that the inductance being sought is characterized by a known probability distribution. In fact, the system of Jamneala inherently assumes that there is a

unique solution to the optimization protocol applied therein. That is, the inductance sought in Jamneala is characterized by a unique value, not a probability distribution.

Second, the simulator of Jamneala varies the value of the inductance parameter in the model to produce an optimum fit to the circuit model. The system of Piratelli-Filho varyies the values of a number of parameters on which a measurement depends to determine the probability distribution for that measurement as a result of the uncertainties in those parameters. To apply the method of Piratelli-Filho to Jamneala, the probability distributions of the other parameters in the circuit would need to be known. One would then vary those parameters in a manner consistent with those distributions to determine the resultant distribution for the inductance sought in Jamnaela. This woul require measuring the probability distributions for the other parameters in the model taught by Jamneala. Furthermore, at each iteration, one would still need to perform the optimization computation of Jamneala to determine the resultant value for the inductance in question. Hence, one would need to substantially redesign the algorithm and model of Jamnaela to make a furnctioning system combining the two teachings.

> "If the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious. *In re Ratti*, 270 F.2d 810, 123 USPQ 349 (CCPA 1959) (Claims were directed to an oil seal comprising a bore engaging portion with outwardly biased resilient spring fingers inserted in a resilient sealing member. The primary reference relied upon in a rejection based on a combination of references disclosed an oil seal wherein the bore engaging portion was reinforced by a cylindrical sheet metal casing. Patentee taught the device required rigidity for operation, whereas the claimed invention required resiliency. The court reversed the rejection holding the "suggested combination of references would require a substantial reconstruction and redesign of the elements shown in [the primary reference] as well as a change in the basic principle under which the [primary reference] construction was designed to operate." 270 F.2d at 813, 123 USPQ at 352.)".

Accordingly, Applicant submits that as currently amended, claim 1 and the claims dependent therefrom are not obvious in view of the cited prior art.

The Examiner rejected claim 5 under 35 U.S.C. 103(a) as being unpatentable over Jamneala et al. (U.S. Patent No. 6,804,807), in view of Piratelli-Filho et al. (Uncertainty Evaluation in small angle Calibration using ISO GUM Approach and Monte Carlo Method, June 2003), and further in view of Helisto et al. (Measurement Uncertainty in the 1/f noise region: Zener Voltage Standards, IEEE 2000). Applicant submits that as currently amended, claim 5 is not obvious in view of the cited prior art.

The Examiner states that the combination of Jamneala and Piratelli-Filho teach the limitations of claim 5 except for the plurality of probability distributions including a noise term. The Examiner looks to Helisto for the missing teachings. The Examiner maintains that it would have been obvious to apply the uncertainty measurement method of Helisto et al. to Jamneala/Piratelli-Filho to "enable the measurements down to the fundamental noise limit of metrological devices (see pg.402)".

As noted above with respect to claim 1, from which claim 5 depends, Applicant submits that Jamneala in view of Piratelli-Filho does not teach the limitations of the base claim. Helisto does not provide the missing teachings. The issue is not whether noise terms are known to the art, but rather whether adding such a term to the teachings of the references in question would lead to operative system that does not require a substantial redesign of the Jamnaela system

Accordingly, Applicant submits that as currently amended, claim 5 is not obvious in view of the cited prior art

Allowable Subject Matter

Applicant notes that claims 8-10 and 12 are allowed.

Respectfully Submitted,

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